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A new species of the millipede genus *Koponenius* Golovatch et VandenSpiegel, 2014, from Nepal (Diplopoda: Polydesmida: Haplodesmidae)

Новый вид многоножек рода *Koponenius* Golovatch et VandenSpiegel, 2014, из Непала (Diplopoda: Polydesmida: Haplodesmidae)

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КЛЮЧЕВЫЕ СЛОВА: Polydesmida, *Koponenius*, таксономия, новый вид, Непал.

ABSTRACT. *Koponenius*, the westernmost genus of the basically Australasian family Haplodesmidae which has hitherto been known by three species only, one each from northern India, Nepal and Myanmar, is again found in Nepal through the discovery of *K. schawalleri* Golovatch et VandenSpiegel **sp.n.**

РЕЗЮМЕ. *Koponenius*, самый западный род в основном австралазиатского семейства Haplodesmidae, который до сих пор был известен лишь по трём видам, по одному из Северной Индии, Непала и Мьянмы, снова отмечен в Непале, благодаря находке *K. schawalleri* Golovatch et Vanden Spiegel **sp.n.**

Introduction

The diplopod genus *Koponenius* Golovatch et VandenSpiegel, 2014, has only been described very recently, being represented by *K. unicornis* Golovatch et VandenSpiegel, 2014, the type-species from the Himalayas of Darjeeling District, northeastern India, *K. biramus* Golovatch et VandenSpiegel, 2014, from eastern Nepal, and *K. simplex* Golovatch et VandenSpiegel, 2015, from Myanmar [Golovatch, VandenSpiegel, 2014, 2015]. This oligotypic genus seems to be the westernmost native member of the basically Australasian family Haplodesmidae. The latter family is rather small, encompassing some 70+ species from seven genera [Golovatch, VandenSpiegel, 2014]. Of them, 46 species currently belong to the largest and especially widespread genus *Eutrichodesmus* Silvestri, 1910, which ranges from southern Korea, southern Japan and Taiwan in the northeast, through southern continental China, Indochina, Malay Peninsula and Indonesia, to New Guinea and Melanesia in the southeast [Minelli, 2015]. Thus, the indigenous distribution of this genus largely repeats that of the entire family, except for its absence from Australia and the Himalayas.

The present paper is devoted to the description of a 2nd *Koponenius* found in Nepal. Due to its biramous gonopods, this new species which comes from south-central Nepal shows especially close similarities to *K. biramus*, the sole other congener reported from that country.

Material and methods

The material treated below was collected in south-central Nepal by Wolfgang Schawaller (Stuttgart, Germany). The holotype and most of the paratypes are housed in the Zoological Museum of the Moscow State University (ZMUM ρ entry number), two paratypes are in the Natur-Museum Senckenberg, Frankfurt/M. (SMF), Germany, as indicated below. SEM micrographs were taken using a JEOL JSM–6480LV scanning electron microscope. After examination, SEM material was removed from stubs and returned to alcohol, now in SMF.

Koponenius schawalleri
Golovatch et VandenSpiegel, **sp.n.**
Figs 1–23

HOLOTYPE ♂ (ZMUM ρ3111), Nepal, Chitwan Distr., Chitwan National Park, near Sauraha, 150 m a.s.l., forest, 31.V–4.VI.2014, leg. W. Schawaller.

PARATYPES: 1 ♂, 5 ♀♀ (ZMUM ρ3112), 1 ♂ (SEM), 1 ♀ (SMF), same locality, together with holotype.

NAME. Honours Wolfgang Schawaller, the collector.

DIAGNOSIS. Differs from *K. biramus*, the only other congener showing a biramous gonopod telopodite [Golo-

vatch, VandenSpiegel, 2014], by the extremely long and flagelliform solenomere (**sl**) which is considerably longer than the finger-shaped, largely rugose lateral process (**p**).

DESCRIPTION. Length in both sexes ca 7–8 mm, width 0.7–0.8 and 1.0–1.1 mm on midbody pro- and metazonae, respectively. Holotype ca 7 mm long, 0.7 and 1.0 mm wide on midbody pro- and metazonae, respectively. Coloration in alcohol mostly light: metaterga, pleurosternal and midsternal regions brown, sometimes reddish-brown; vertigial region brown; antennae, prozonae, ozopores and tip of epiproct nearly pallid (Figs 1–2).

Body with 19 segments in both sexes, subcylindrical, not capable of volvation. Collum and following metaterga clothed with a dense, dull, microvillose cerategument crust (Figs 3–8, 14–16); vertigial region down to a well-expressed border with clypeolabral region clearly granular (Fig. 9). Clypeolabral region densely setose (Fig. 9). Antennae short and clavate, in situ each placed inside a deep, transverse, nearly C-shaped groove (Fig. 9); in length, antennomere 6 > 2 > 1 > 3 = 4 = 5; both antennomeres 5 and, especially, 6 with a tight dorso-apical group of bacilliform sensilla.

In width, head < segment 3 < 4 < collum = segment 2 < 5–15, thereafter body gradually tapering towards telson (Figs 6–8). Collum hood-shaped, regularly rounded at fore margin, concealing the head from above (Figs 2, 3, 6, 9). Paraterga rather well-developed, strongly declined, mostly wing-shaped, set low (at about lower ¼ of midbody height), starting with collum, laterally vaguely lobulate (Figs 1–11). Paraterga 2 clearly enlarged, subtending the head on both sides. Dorsum very convex (Figs 1–5, 13). Postcollum metaterga usually with 4–5, regular, transverse rows of rather flat, sometimes clearly obliterated, setigerous, isostictic (= regular in axial direction), mostly roundish bosses or tubercles (Figs 1–8); caudal row of particularly elongate bosses forming a faint constriction (Fig. 7), caudal series of lobulations ending up in a distinct crenulate limbus (Fig. 16); fore row likewise forming a row of similar lobulations (Figs 2–8). Caudolateral corner of postcollum paraterga mostly well rounded, nearly pointed only in segments 17 and 18 (Figs 5, 8). Ozopores borne on conspicuous dorsolateral porosteles, these lying close to caudolateral corners of paraterga; pore formula 5, 7–18 (Figs 1–8, 14). Tergal setae filiform, rather long (Figs 1–11, 13). Epiproct strongly flattened dorsoventrally, lobulated laterally, subtruncate caudally, but tip located ventrally, invisible from above (Figs 1, 5, 8, 11). Hypoproct subtrapeziform (Fig. 11).

Sterna narrow, but evident, mostly slightly elevated due to small subtriangular lobules observed between both coxae (Figs 9–11). Spiracles apparently absent. Legs mostly tightly appressed to venter, densely setose, short and stout, about as long as body height, slightly longer and more incrassate in ♂ compared to ♀, devoid of micropapillae (Figs 19, 21).

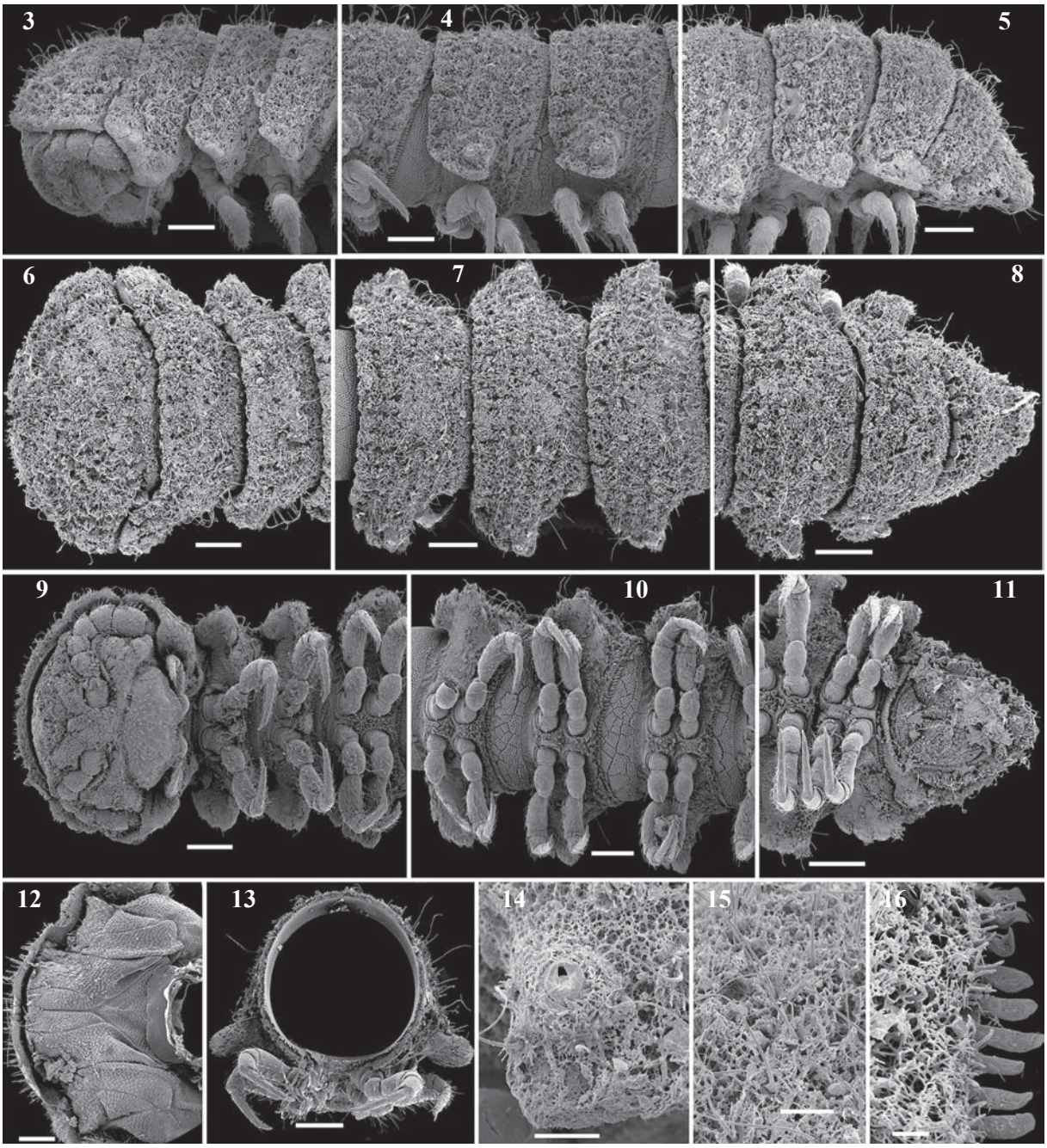
Gonopod aperture obcordate (Fig. 19). Gonopods (Figs 17–18, 20, 22–23) with long, subcylindrical, mediobasally fused, sparsely setose and densely papillate coxae each carrying a small, but evident, rounded, lateral lobe apically; cannulae long and slender. Telopodite strongly elongated, considerably longer than coxa, slender; prefemoral (= densely setose) portion suberect, ca 1/3 as long as entire telopodite, set off by a distinct cingulum from a suberect, only slightly curved acropodite; the latter divided immediately distal to



Figs 1–2. Habitus of *Koponenius schawalleri* **sp.n.**, ♂ paratype, lateral (1) and dorsolateral (2) views, respectively. Pictures by A. Mathys. Scale bar: 1.0 mm.

Рис. 1–2. Общий вид *Koponenius schawalleri* **sp.n.**, паратип ♂, сбоку (1) и одновременно сверху и сбоку (2). Фотографии A. Mathys. Масштаб: 1,0 мм.

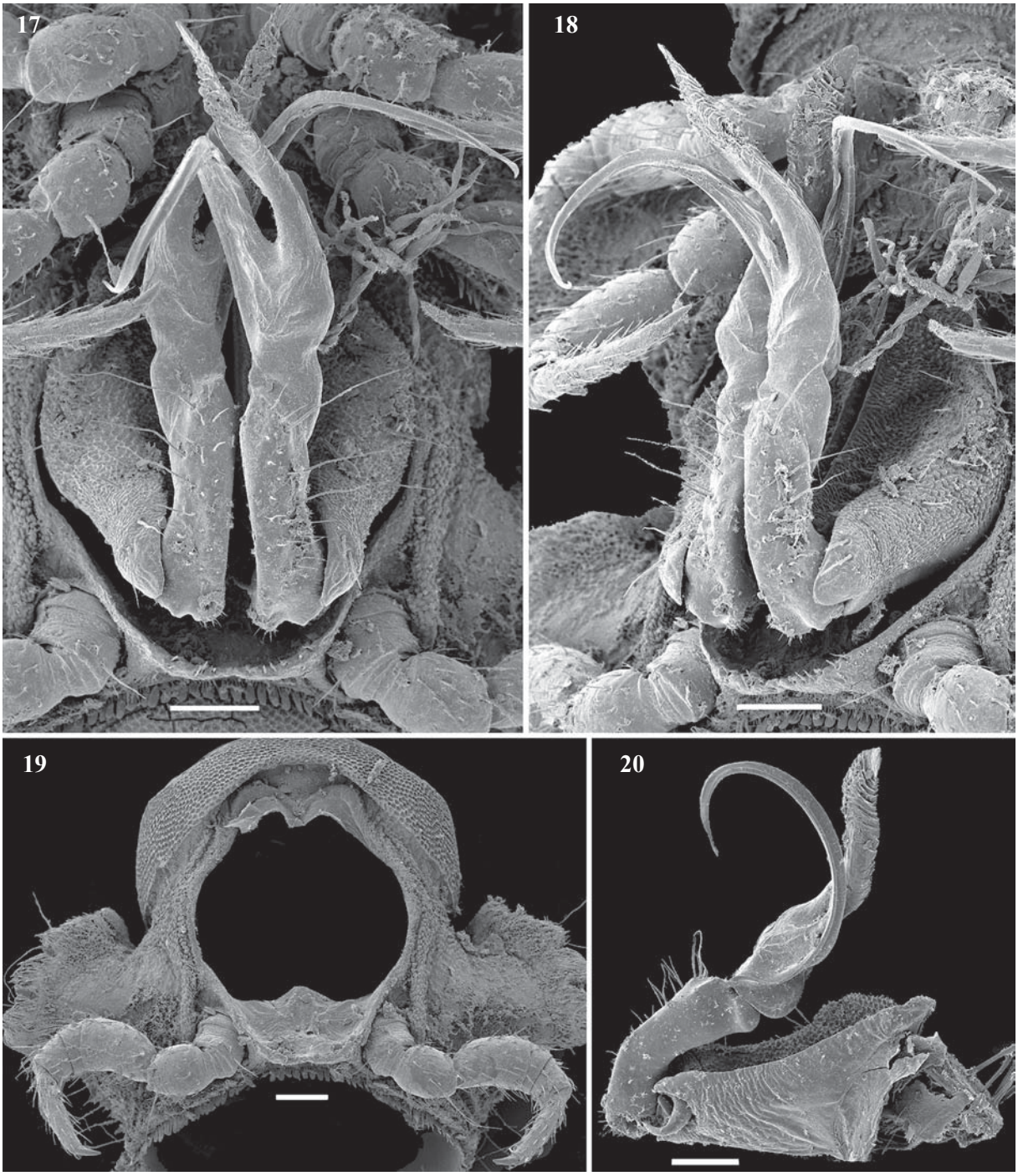
cingulum into an unusually long, flagelliform, mesal solenomere (**sl**) and a finger-shaped, membranous, slightly shorter, lateral process (**p**) clearly rugose in distal half; seminal groove shifted laterad shortly after its origin due to a twisted prefemoral portion, thereafter running on lateral side until cingulum to return to mesal side and pass onto **sl** (Figs 22–23). Neither an accessory seminal chamber nor a hairy pulvillus.



Figs 3–16. SEM micrographs of *Koponenius schawalleri* **sp.n.**, ♂ paratype. 3, 6, 9 — anterior part of body, lateral, dorsal and ventral views, respectively; 4, 7, 10 — midbody segments, lateral, dorsal and ventral views, respectively; 5, 8, 11 — posterior part of body, lateral, dorsal and ventral views, respectively; 12 — gnathochilarium, ventral view; 13 — cross-section of a midbody segment, caudal view; 14 — ozopore region, lateral view; 15 — tergal texture, dorsal view; 16 — limbus, dorsal view. Scale bars: 0.2 (3–11, 13), 0.1 (14), 0.05 mm (14–15), 0.01 mm (16).

Рис. 3–16. SEM-микрофотографии *Koponenius schawalleri* **sp.n.**, паратип ♂. 3, 6, 9 — передняя часть тела, соответственно сбоку, сверху и снизу; 4, 7, 10 — среднетуловищные сегменты, соответственно сбоку, сверху и снизу; 5, 8, 11 — задняя часть тела, соответственно сбоку, сверху и снизу; 12 — гнатохилярий, снизу; 13 — поперечный разрез среднетуловищного сегмента, сзади; 14 — район озопоры, сбоку; 15 — текстура тергита, сверху; 16 — лимбус, сверху. Масштаб: 0,2 (3–11, 13), 0,1 (14), 0,05 mm (14–15), 0,01 мм (16).

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Figs 17–20. SEM micrographs of *Koponenius schawalleri* **sp.n.**, ♂ paratype. 17–18 — both gonopods in situ, ventral and ventrolateral views, respectively; 19 — segment 7 with gonopod aperture, ventral view; 20 — right gonopod, mesal view. Scale bars: 0.1 mm.

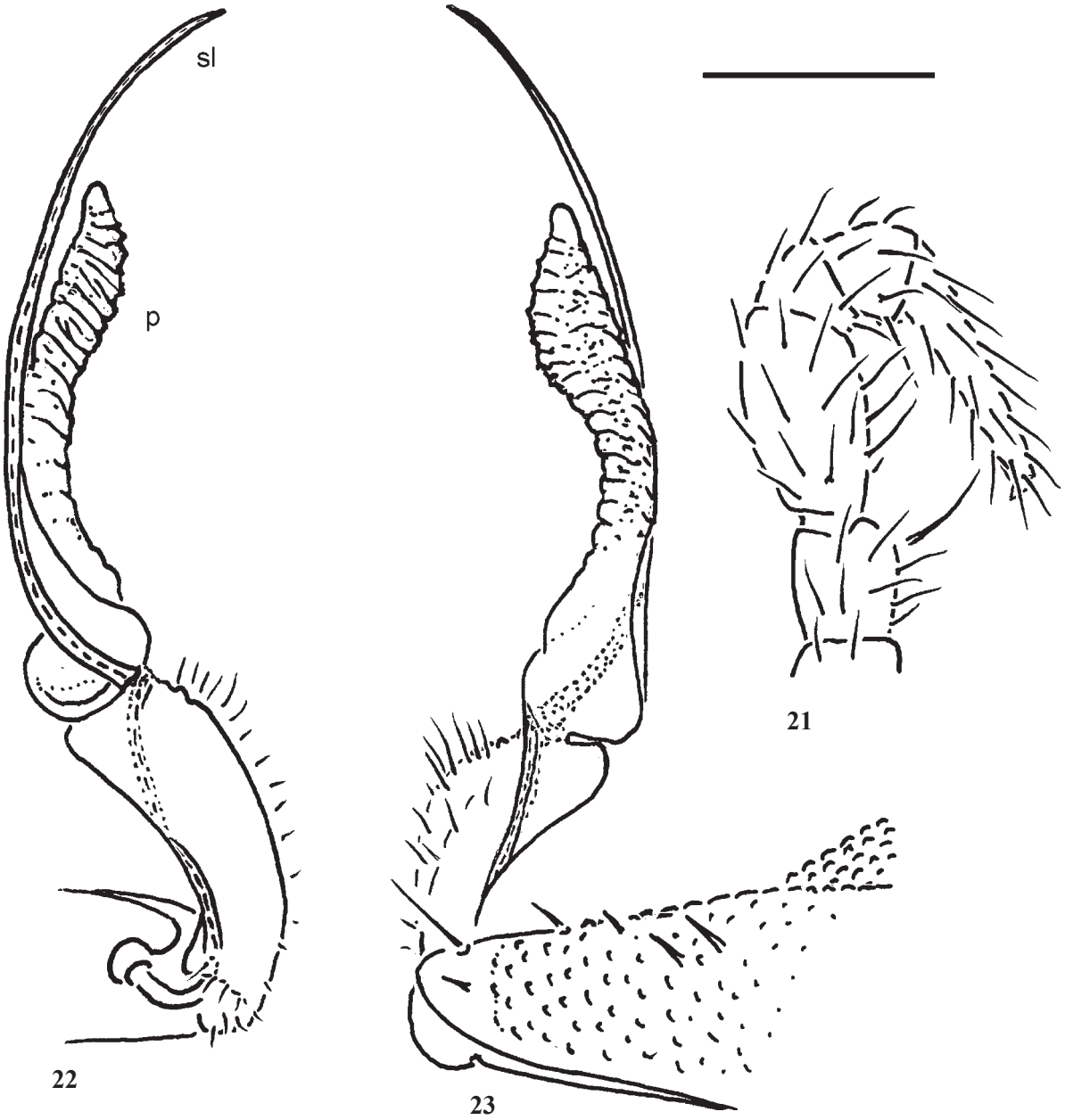
Рис. 17–20. SEM-микрофотографии *Koponenius schawalleri* **sp.n.**, паратип ♂. 17–18 — оба гонопода на месте, соответственно снизу и одновременно снизу и сбоку; 19 — сегмент 7 с отверстием гоноподов, снизу; 20 — правый гонопод, изнутри. Масштаб: 0,1 мм.

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Figs 21–23. *Koponenius schawalleri* **sp.n.**, ♂ paratype. 21 — leg 7, lateral view;22–23 — left gonopod, mesal and lateral views, respectively. Scale bar: 0.2 mm.

Рис. 21–23. *Koponenius schawalleri* **sp.n.**, паратип ♂. 21 — нога 7, сбоку; 22–23 — левый гонопод, соответственно изнутри и сбоку. Масштаб: 0,2 мм.